

GENERA OF BAETIDAE (EPHEMEROPTERA) FROM CENTRAL AMERICA¹

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ABSTRACT: In addition to eight genera of Baetidae (Ephemeroptera) previously authenticated as occurring in Central America, we report or confirm for the first time the occurrence of *Acerpenna* Waltz and McCafferty and *Baetis* Leach. New records of *Acerpenna* from Belize, Costa Rica, Honduras, Nicaragua, and Panama indicate the genus is well established in the Neotropics. *Baetis magnus* McCafferty and Waltz (*rhodani* group) is newly reported from Costa Rica and Guatemala. The generic placement of *Baetis sinuosus* Navás (probably *fuscatus* group) is provisionally accepted and thereby confirms the presence of a second species of *Baetis* in Central America. Whereas most baetid genera in Central American have Neotropical affinities, the *Baetis* spp. appear to have Nearctic affinities.

Eight genera of the mayfly family Baetidae have been correctly reported from Central America. The biogeography of these genera was treated by McCafferty *et al.* (1992). *Baetodes* Needham and Murphy was first reported from Central America (Honduras) by Packer (1966). Subsequent records include Cohen and Allen (1972) (El Salvador and Guatemala), Cohen and Allen (1978) (Panama), and McCafferty (1985) (Belize and Costa Rica). *Callibaetis* Eaton was first reported from an unspecified Central American country by Eaton (1881). Subsequent records include Eaton (1885) (Guatemala), Packer (1966) (Honduras), and McCafferty and Lugo-Ortiz (1992) (Nicaragua). *Camelobaetidius* Demoulin was reported from Costa Rica, El Salvador, Guatemala, Honduras, and Panama by Traver and Edmunds (1968). *Cloeodes* Traver was reported from Panama by Flowers (1991). *Fallceon* Waltz and McCafferty was reported (as *Baetis* s. lato) from Belize and Costa Rica by McCafferty (1985). *Guajirolus* Flowers was described from Panama by Flowers (1985). *Moribaetis* Waltz and McCafferty was reported from Costa Rica, Guatemala, and Panama by Waltz and McCafferty (1985). *Paracloeodes* Day was reported from Panama by Flowers (1991).

All of the above genera, with the exception of *Guajirolus* and *Moribaetis*, which are strictly Neotropical, are Panamerican (Nearctic plus Neotropical). In addition to the above reported Central American records, we have seen *Cloeodes* from Costa Rica and Honduras; *Fallceon* from Honduras; *Guajirolus* from Costa Rica; and *Paracloeodes* from Costa Rica and Honduras.

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In their analysis of Mesoamerican mayflies, McCafferty *et al.* (1992) showed the Central American baetid fauna generally to have Neotropical affinities, rather than Nearctic. Although McCafferty *et al.* (1992) did not know *Paracloeodes* from Central America at that time, they predicted its presence there, which would corroborate a recent Neotropical center of dispersal for the genus. McCafferty *et al.* (1992) considered the distributional and cladistic data regarding *Callibaetis* to be too inconclusive for deciphering a biogeographic history for the genus. Neotropical elements of this Western Hemisphere genus must be better understood prior to hypothesizing its evolutionary history.

We have discovered one additional genus of Baetidae from Central America and confirm the presence of another genus previously reported on the basis of less restrictive generic concepts. Below, we provide these records and discuss their significance.

Acerpenna Waltz and McCafferty

The *Acerpenna* we report from Central America is represented by larvae of two new species to be described elsewhere.

NEW RECORDS. *Acerpenna* spp. BELIZE. Cayo Prov.: Roaring Creek, VI/20/74, V. Resh, larvae, PERC (Purdue Entomological Research Collection, West Lafayette, Indiana); (?): Sibun River, Gracy, 19/VI/74, V. Resh, larvae, PERC. COSTA RICA: Guanacaste prov.: Río Tenorio at Finca La Pacifica, E of Panamerican Hwy., II/8-11/69, W. P. McCafferty, larvae, PERC; Limón Prov.: Río Banano, 16 km. WSW of Bomba, 9.888°N/83.167°W, 150 m., III/26/87, Holzenthal, Hamilton, and Heyn, larvae, FAMU (Florida A&M University, Tallahassee, Florida); San José Prov.: Río parmita Chiquito, Rt. 12, 6.5 km. SW jct. Rt. 2., 9.703°N/83.970°W, IV/10/87, Holzenthal, Hamilton, and Heyn, larvae, FAMU. HONDURAS. Cortes Prov.: Chamalech, Río Chamel, X/18/64, J. S. Packer, larvae, PERC. NICARAGUA: Presa El Clavo, IX/10/80, larvae, PERC.

REMARKS. The genus *Acerpenna* was erected by Waltz and McCafferty (1987b) to include *A. macdunnoughi* (Ide) and *A. pygmaea* (Hagen). Later, McCafferty and Waltz (1990) added *A. akataleptos* (Traver) and *A. harti* (McDunnough). All of these species occur in North America north of Mexico, the southernmost range of any being that of *A. pygmaea* in the Edwards Plateau in central Texas (McCafferty and Davis 1992; Lugo-Ortiz and McCafferty, 1993).

The discovery of *Acerpenna* in the Neotropics is significant, indicating an additional Panamerican baetid genus. Waltz (pers. comm.) has seen female adults of *Acerpenna* from Panama, and we have also found the genus in South America and the Greater Antilles, and we expect to find it in Mexico. Further analysis of the group may indicate that *Acerpenna* is yet another Panamerican baetid genus of Neotropical origin.

Baetis Leach

Our Central American record of *Baetis* is based on larvae of *B. magnus* McCafferty and Waltz. This species is a member of the *rhodani* group of species, which in the Nearctic is particularly well represented in the southwestern United States (Moriyara and McCafferty 1979). *Baetis magnus* is known as far north as western Nebraska (McCafferty and Waltz 1986), and we recently have found it throughout Mexico.

NEW RECORDS. *Baetis magnus*. COSTA RICA. Cartago Prov.: Reserva Tapanti, Río Badilla, 9.688°N/83.757°W, 1640 m., III/21/87, Holzenthal and Hamilton, larvae, FAMU; Río Birris, Rt. 8 ca. 2.5 km (air) NE of San Juan de Chicao, 9.960°N/83.844°W, 2850 m., II/4/86, Holzenthal, Morse, and Fasth, larvae, FAMU; Puntarenas Prov.: Río Bellavista, ca. 1.5 km NW of Las Alturas, 8.951°N/82.846°W, 1400 m., VI/15-17/86, Holzenthal, Heyn, and Armitage, larvae, FAMU; Río Sinigri, ca. 2 km (air) S of Finca Helechales, 9.057°N/83.082°W, 720m., II/21/86, Holzenthal, Morse, and Fasth, larvae, FAMU; Río Jaba at rock quarry, 1.4 km (air) W of Las Cruces, 8.79°N/82.97°W, 1150 m., VI/14/86, Holzenthal, Heyn, and Armitage, larvae, FAMU; San José Prov.: Parque Nacional Braulio Castillo, park headquarters, 10.059°N/84.017°W, 1650 m., VII/7/86, Holzenthal, Heyn, and Armitage, larvae, FAMU; 12 mi. N of San Isidro del General, Panamerican Hwy., 5200 ft. VII/20/62, G. G. Musser, larvae, PERC. GUATEMALA. Solala Prov.: River at Panajachel, I/16/89, B. C. Kondratieff, larvae, PERC.

REMARKS. The genus *Baetis* has been the subject of considerable recent revisionary work that has resulted in many synonymies and recombination of species and the recognition of new genera (Moriyara and McCafferty 1979; Waltz and McCafferty 1985, 1987b, 1987c; McCafferty and Waltz 1990). As pointed out by McCafferty *et al.* (1992), no previous records of *Baetis* s. str. in Central America have been confirmed. Navás (1924) described *Baetis sinuosus* from Costa Rica on the basis of a male adult. We have not been able to secure Navás' material for evaluation. Our examination of Navás' description and figure of the hindwing does, however, indicate a strong probability that it is a true *Baetis*, most likely of the *fuscatus* group. Moreover, it has an apparent similarity to *B. flavistriga* McDunnough, a widespread North American species that we have seen in northern Mexico. We are therefore provisionally confirming the present generic placement of this species.

Although South American species have been described in the genus *Baetis* (see Hubbard and Peters 1981; Hubbard *et al.* 1992), those generic placements are doubtful and have yet to be verified. If the Neotropical element of *Baetis* proves to be limited to a sparse representation in Central America as indicated, then it apparently is one of the few examples of a Panamerican group whose Neotropical representatives are derived from the Nearctic. This has been shown to be the case for a relatively small number of mayfly genera, such as *Isonychia* Eaton (Isonychiidae)

and *Stenonema* Traver, *Rhithrogena* Eaton, and *Iron* Eaton (Heptageniidae) (see McCafferty *et al.* 1992).

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1933 CALVERT AWARD PRESENTED FOR STUDY OF STREAM INVERTEBRATES

Justin Schilling grew up near Wissahickon Creek in southeastern Pennsylvania. He noticed that a small tributary flowing near a limestone quarry had a lot of chalky sediment. He hypothesized that the sediment was limestone dust (calcium carbonate) and that mollusks whose shells are made of calcium carbonate would be more abundant on Wissahickon Creek downstream from the tributary. After a thorough study of water quality and an analysis of stream invertebrates at three locations, he refuted his hypothesis. In the process he learned a lot about the identification of local aquatic insects. Among the approximately 25 students who entered insect-related projects at the Delaware Valley Science Fairs, Justin was one of the few who could discuss insect biology and taxonomy. The American Entomological Society awarded Justin Schilling its annual Calvert Award for his project entitled "The Effects of a Limestone Tributary on Invertebrate Life in the Wissahickon Creek." Justin is a sophomore at Abington Friends School in Jenkintown, Pennsylvania.

The Calvert Award recognizes outstanding insect-related work by a young person in the Delaware Valley. It honors Dr. Philip P. Calvert who joined the Society as a teenager, later became its president, and was a member for 74 years until his death in 1961. As a professor of biology at the University of Pennsylvania and as an associate of the Academy of Natural Sciences of Philadelphia. Dr. Calvert stimulated an interest in insects among many young people. The award includes membership in The American Entomological Society and the Young Entomologists' Society and a check for \$50.

The Calvert Award was presented April 28 at the Society's membership meeting at the Academy of Natural Sciences of Philadelphia. Also honored were Benjamin Martin for his runner-up project, "The Extraction and Testing of Natural Pesticides", and Ben Blanchard for his honorable mention project, "A Quantitative Study of Water Quality in Local Streams using Macroinvertebrates."

Harold B. White, Vice President. A.E.S.
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